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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/697,045

10/31/2003

Takashi Kuroi

244521US-2 DIV

8375

22850

7590

10/19/2004

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ALEXANDRIA, VA 22314

EXAMINER

POMPEY, RON EVERETT

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/697,045

Applicant(s)

KUROI ET AL.

Examiner

Ron E Pompey

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10 and 13-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10 and 13- 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krivokapic et al.(US 6,087,208).

Krivokapic discloses the limitations of:

a) forming a structure (40 and 50, fig. 10) on a main surface of a substrate in an area in which a gate electrode is formed later;

(b) forming source/drain regions (78 and 80, fig. 11) in said main surface of said substrate in an area in which said structure is not formed;

(c) forming a first insulating film (190, fig. 15) on said main surface of said substrate in an area in which said structure is not formed;

(d) after said step (c), removing said structure (fig. 17);

(e) forming a second insulating film on the construction obtained by said step (d) and etching said second insulating film by an anisotropic etching whose etching rate is higher in depth direction of said substrate to form sidewalls (194 and 196, fig. 18) on sides of said first insulating film; and

forming said gate electrode (220, fig. 20) to fill an inversely tapered recessed part formed by sides of said sidewalls and an upper surface of said gate insulating film; and

Art Unit: 2812

(f) forming a gate insulating film (210, fig. 19) composed of a third insulating film on said main surface of said substrate in an area in which said first insulating film and said sidewalls are not formed (col. 15, ln. 30 – col. 16, ln. 43).

wherein, in said step (a), said structure is formed by stacking a first film (40, fig. 8) composed of a material which is different from that of said second insulating film and a second film (50, fig. 10) composed of a material which is different from that of said first insulating film in this order and said step (d) comprises the steps of: (d-1) between said step (c) and said step (e), removing said second film with said first film left unremoved (fig. 17) and (d-2) between said step (e) and said step (f), removing said first film by an etching.

Krivokapic does not disclose the claimed limitation(s) of:

Anisotropic or wet etching.

However,

Krivokapic discloses using any suitable etchants for removal of the dummy gate and the unmasked portion of the thin gate oxide, in column(s) 8, line(s) 19-17.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use anisotropic or wet etching, because these are common ways to etch materials in the semiconductor art.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 10 and 13-20 have been considered but are moot in view of the new ground(s) of rejection.

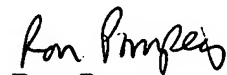
Art Unit: 2812


**Conclusion**

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (571) 272-1680.

  
Ron Pompey  
AU: 2812  
October 18, 2004

  
John F. Niebling  
Supervisory Patent Examiner  
Technology Center 2800